4 Pages of Fallout Revelations

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The Real Lesson of the Radiation Hearings

The contamination of man's atmosphere and food by fallout is increasing at a much faster rate than was expected two years ago. Should testing of nuclear weapons resume it will soon become a health hazard. This is the real lesson to be drawn from the hearings just ended by the radiation subcommittee of the Joint Committee on Atomic Energy.

Two years ago, after the first hearings of this kind, the Joint Committee concluded that further testing "over the next several generations . . . could constitute a hazard." Now it seems that if testing resumes, the hazard will be with us within our lifetime. When the first Kulp studies of human bone appeared in *Science* two years ago, he estimated that strontium 90 would reach a peak of one or two micromicrocuries per gram of calcium in human bone by 1970. Now the Fallout Prediction Panel, as it reported to the new radiation hearings, expects 5 to 10 micromicrocuries in the peoples of the northern hemispheres by 1962-65. The year of maximum danger is thought to be 8 to 5 years closer; the maximum level expected is now 5 times as great. This is progress, but not to any pleasant destination.

But Holifield Thinks Testing Could Resume

These new figures are based on the results of testing so far. The panel made no predictions as to what levels would be if testing resumed. "Since testing by the three present nuclear powers essentially doubled the biospheric contamination in a single year," Wright Langham and E. C. Anderson reported from Los Alamos, "prediction of levels with continued testing is fruitless. The extent of future biospheric contamination will depend largely on the number of nations that choose to became independent nuclear powers, the time sequence of their development and probably on the locations of their respective test sites."

These sober perspectives have been hidden from view by a cloud of reassuring AEC statements which preceded and accompanied the hearings. Whereas two years ago, the radiation subcommittee chairman, Chet Holifield, of Los Angeles, was probing and critical, this time he revolved in the AEC's orbit. It will take months fully to evaluate the mass of documents poured raw into the record, but the hearings were hardly ended when Chairman Holifield told the Washington *Evening Star* (May 11), "It is clear now that the possible hazard is very small in comparison to the needs of our defense," and added, "I believe testing could be resumed, if necessary, at a limited rate."

The *Star* quoted Holifield as saying that radiation from fallout was "roughly 10 percent of the natural background radiation that always has existed." But E. A. Martell, Geophysics Research Director, Air Force Cambridge Research Center, reporting to the subcommittee on "Global Fallout and Its Variability" had less reassuring figures to offer. "In areas of high fallout in the northern hemisphere during 1957 and 1958," Dr. Martell told the subcommittee, "the external gamma radiation from fallout is estimated to be about one-half of that from natural sources." Should testing resume, the increase in external gamma radiation will become serious.

Adequate Enough For An Unlovely Subject?

"It is the opinion of the Committee that the level of effort the AEC has devoted to its research programs on radiation standards and protection, in their broadest sense, has been quite adequate."

—AEC's General Advisory Committee Report, May 7.

Mr. [James T.] RAMEY [executive director, Joint Committee on Atomic Energy]. I think a newspaper reporter who happens to be in the room pointed out that the [Atomic Energy] Commission only had two full-time employees who were concerned with fallout as such.

Dr. [Charles L.] DUNHAM [M.D., director, Division of Biology and Medicine, Atomic Energy Commission]. This is true, Mr. Ramey. Unfortunately fallout is a sort of an unlovely subject."

—Radiation Subcommittee Hearing, May 8.

A Rather Cavalier Optimism

Congressman Holifield admitted the great unknown was the biological effect of small quantities of radiation but thinks the answer will never be learned. "The effect," he told his interviewer, "is too small to be measured exactly." The Prediction Panel at his hearings was more cautious. "The panel, as a group," it reported, "felt that no single or simple relation between radiation dosage and biological effect has as yet been established, particularly at the low dosages to be expected from offsite fallout. Therefore, no attempt was made to convert the predicted concentrations of Cs-137 and Sr-90 into the number of tumors, cases of leukemia, genetic effects and the like. The biological effects, if any, to be expected *from past tests* would be manifest in a very small proportion of the world's population, *but because the population is so large, the absolute numbers calculated under certain assumed relations appear startlingly large.*" The italics are added. Nobody on the subcommittee asked what these startlingly large numbers were, nor asked how much larger they would be if testing resumed.

Only Senator Anderson of New Mexico, the chairman of the Joint Committee, sharply questioned the official witnesses. Unfortunately most of his time was taken up with the hearings before the Senate Commerce Committee on the nomination of Lewis Strauss to be Secretary of Commerce. The other mem-

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bers of the radiation subcommittee acted like dutiful listeners to an official briefing rather than Congressional investigators digging sharply beneath official double-talk.

Rapid-Fire Hearings

The first radiation hearings took eight full days. This year's lasted only three and a half. The bulk of them was taken up with the official AEC briefings. The panel discussions, on which a few independent voices made themselves heard, were opened and shut with rapid fire attention to a narrow time schedule. 'I think it is important," Mr. Holifield told his subcommittee, "that no pertinent points be swept under the rug." Those who study the record for themselves when it is published some time in August will see that there is considerable important debris beneath the rug.

A striking example are the new results and anxieties reported by two researchers in the field of iodine-131, which Dr. E. B. Lewis, professor of biology at Caltech, called "a serious fallout hazard whose importance had not yet been fully appreciated at the time of the 1957 hearings." Dr. Lewis reported that "for the last few years testing" the thyroid glands of infants and children in the United States have been exposed to "average annual doses" from this short-lived isotope which are one to two times as great as natural radiation and "could produce some cases of thyroid cancer in the exposed population." Dr. Arthur H. Wolff, of the division of radiological health, U. S. Public Health Service, reported that levels of iodine-131 have reached the point where the public health service has included it "as well as certain other short-lived radionuclides in its milk surveillance program." Their prepared papers were included in the bewildering mountain of material thrown on the press tables but Dr. Lewis was not invited to appear and Dr. Wolff managed only to achieve some references to this new danger in one of the panels. Yet the discovery that fallout is coming down faster than expected, and that Russian tests in the Arctic circle drop their fallout in the northern hemisphere within a year, means that more short-lived isotopes reach the earth while still virulent and that we can no longer assume that only long-lived isotopes like strontium-90, caesium-137 and carbon-14 are all we need worry about. Surely the danger of radio-iodine to small children was worth fuller attention.

Just Russian Propaganda?

"If this process of testing . . . can continue without contamination of the world's atmosphere, you certainly take away from the Soviets one of their greatest weapons of propaganda."

—Cong. Chet Holifield to Dr. Willard F. Libby, Radiation Subcommittee, May 8.

"Evidence is increasing that exposures of the population to ionizing radiation, at levels previously thought safe, are, in fact, injurious. . . . Because radiation effects are cumulative and irreversible and because of increasing levels of radiation exposure of the public from all sources, including medical and dental x-rays, industrial applications of radiation-producing devices and nuclear energy, and world-wide weapons tests, it is most urgent that there be no delay in the further development and application of measures to protect the public from radiation hazards."

—Public Health Service Report to the House Approp. Committee, p. 147, 1960 Budget Hearings, Apr. 24.

More New Poisons In The Air

It is tantalizing to rummage in the heap of press releases and find so much left at loose ends. In the Langham-Anderson analysis quoted above, for example, one reads that present levels of caesium-137 in the general population now average 67 micromicrocuries per gram of potassium but that "levels may not go much higher if weapons tests stop because Cs-137

The Delusions Created by Project Argus About "Fallout Free" Outer Space Shots

Project Argus, after its disclosure by the New York Times on March 19, created the impression that these atomic shots 300 miles out in space provided (1) a new defense technique against enemy missiles and (2) a way to test nuclear weapons without creating fallout.

We now offer for the record official denials of both these misconceptions. On Thursday, May 7, Dr. Herbert F. York, director of Defense Research and Engineering, the man who was in charge of Project Argus, appeared before the Senate Space Committee.

Speaking of both Project Argus and the earlier Johnston Island shots in the lower atmosphere, Dr. York said that while much of military interest was classified, "I can say though that nothing was found which represents either a breakthrough with respect to how to stop missiles or with respect to how to prevent their being stopped."

Though Dr. York thought this "worth having on the public record," he did not put this in his prepared statement and few papers published his disclosure.

Dr. York's testimony supports the letter by Dr. Walter Selove, Associate Professor of Physics at the University of Pennsylvania, which the New York Times published on March 29. Dr. Selove called it "a delusion to think that a radiation film produced by nuclear explosions above the atmosphere can provide a shield against missiles."

The second bit of evidence to which I would call attention is also due to the quick eye and sharp wit of Dr. Selove. He was a member of the panel which was questioned at the radiation subcommittee hearing on May 8 about the possibility of fallout free nuclear tests in outer space.

While Dr. Libby hedged on the possibility of doing adequate testing in outer space, he did say "As far as the fallout hearings are concerned, I think we can say pretty certainly that this kind of testing gets rid of most of the fallout." Congressman Holifield then asked Dr. Frank Shelton, technical director, Armed Forces Special Weapons Project, "Dr. Shelton, you agree to that?" "Yes," said Dr. Shelton, "I have nothing to add to that statement."

The record, had it ended there, would have been misleading. But Dr. Selove broke in to say that a nuclear explosion "carried out even a few hundred miles above the surface of the earth directs the radioactive particles half toward the earth and half away. The half which are directed toward the earth . . . would travel down toward the atmosphere until it finally became imbedded in it."

"I have observed," Dr. Selove added, "in the official statements that have been made by the U. S. Government there has been no direct statement that fallout from shots above 30 miles will be sharply reduced, although I must say the statements are phrased in such a way that one easily reads them to mean that."

When Dr. Libby was asked by Congressman Holifield to comment, assuming nuclear explosions held 500 to 600 miles out in space, he said Dr. Selove was "completely right," that "something like half" the radioactive particles would come down into the earth's atmosphere.

This disposes of the idea that tests above a 30-mile limit would not create fallout.

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seems to be contaminating the biosphere largely by direct fallout on vegetation and not through soil integration." What does this level mean as a health hazard? It is tantalizing in Dr. Karl Z. Morgan's paper on maximum permissible exposure of the population at large to get a glimpse of "other bone-seeking radionuclides besides SR-90 in the fallout material (e.g., Sr89, Cel44, Zr95)" which are serious enough so that the safe limits for Sr-90 "should be reduced by a factor (we might take 50 percent as an average value) which depends upon many things such as the type weapon, yield, elevation of shot, time since detonation, distance from shot, etc." What are these other new poisons?

Misleading Averages

The whole problem of maximum permissible limits of exposure was handled with more speed than sense. Dr. Jack Schubert, of Argonne National Laboratories, co-author with Ralph Lapp of an excellent book, *Radiation: What Is It and How It Affects You*, was one of the few independents heard. He insisted on reading a prepared paper, though he was only a panel member, in which he threw more light on this subject in a few minutes than had been heard in several days of official reassurances. Dr. Schubert said it was sometimes not appreciated that maximum permissible levels are set as if no other radiation exposure was to be expected except from that one isotope and natural radiation. "Thus," he said, "when the maximum permissible level of strontium-90 is stated to be 67 strontium units [as it is by the International Commission on Radiological Protection—IFS] it must be kept in mind that it is impossible to receive radiation only from strontium-90 in the case of fallout." He said the practical limit should be set at half that amount for Sr-90 since any person who gets that much Sr-90 from fallout will get a roughly equivalent amount of radiation from other isotopes in fallout.

Dr. Schubert also touched on the deceptive use of averages. These may be misleadingly dangerous (1) because so few samples have been examined and (2) the variations in the population may be so wide. Dr. Schubert said maximum permissible levels should not be based wholly on average values "but attention should be given to that fraction of the most sensitive population whose radiation exposure exceeds the average values by two, three, or more," as long as these constitute significantly large numbers. He said that insofar as cancer produced by radiation is concerned, "the most susceptible segment of our population appears to be the unborn child." He said studies of the effects of radiation on the human fetus indicate "that radiation doses so low as to approach the radiation levels from fallout and natural background cause a significant increase in childhood cancer deaths." All this deserved more attention.

Though Chairman Holifield said at the opening of the hearings that they would deal with "hot spots", i.e. areas with unusually high radioactivity, the subcommittee passed over the most important "hot spot" of all with the barest mention. This

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Not One Biologist Among Them

Although the General Advisory Committee to the AEC issued a report discounting the biological dangers of fallout, there is not a single biologist on the Committee. Its members include business and college executives, from institutions with AEC contracts.

The signers of the report were: Eger V. Murphree, president ESSO Research and Engineering; Dr. James W. McRae, vice-president, A. T. & T.; Dr. J. C. Warner, president, Carnegie Tech; Dr. Kenneth S. Pfizer, dean, College of Chemistry, Univ. of Calif., Berkeley; Dr. Jesse W. Beams, chairman, Physics Dept., Univ. of Va.; Dr. Manson Benedict, professor of nuclear engineering, M. I. T.; Dr. Robert E. Wilson, retired chairman, Standard Oil of Indiana; and Dr. Warren C. Johnson, dean of Physical Sciences, Univ. of Chicago.

That Double-Talk About the AEC Releasing All "Significant" Fallout Data

"We find that the Atomic Energy Commission has released all significant fallout data to other agencies and to the public. Certain information as to the estimated yield of various weapons tests and certain other factors bearing on the radioactive content of the upper atmosphere have defense implications which require classification, but the significant information on actual fallout throughout the free world that the AEC has developed has been released."

—AEC's General Advisory Committee Report, May 7.

Chairman [Sen. Clinton P.] ANDERSON [Joint Committee on Atomic Energy]. In your position did you receive the report of the General Advisory Committee?

Dr. [Charles L.] DUNHAM [M.D., director, AEC's Division of Biology and Medicine]. Yes, sir.

Chairman ANDERSON. Did you think it a clear report and a satisfactory one?

Dr. DUNHAM. I thought, considering the time that was available to them, they made a very considered statement, yes, sir. . . .

Chairman ANDERSON. What do you mean by the time available to them?

Dr. DUNHAM. They met in Washington, I think, and for a period of three days, and received information which was provided by the [AEC] Division of Biology and Medicine, by Admiral Parke and AFSWP [Armed Forces Special Weapons Project], and by the Surgeon General of the Public Health Service.

Chairman ANDERSON. We won't quibble. It was two and a half days, wasn't it?

Dr. DUNHAM. Yes, I guess it was.

Chairman ANDERSON. In that two and a half days, you gave them the material and they digested it and came out with this report?

Dr. DUNHAM. That is right.

Chairman ANDERSON. They said all their information on fallout had been released. I referred the other day to the Langham report that is not released. Were they told how much had been released, and how much was not released, so they would not have made that erroneous statement about all the information being released?

Dr. DUNHAM. May I look at a copy of their statement before I answer the question?

Chairman ANDERSON. Yes.

Dr. DUNHAM. I think they used the word 'significant' fallout data, and I don't pretend to know what their interpretation of the word 'significant' is.

Chairman ANDERSON. Then you can't tell whether the report was good or bad until you know what 'significant' meant. . . . Do you find on that basis that all 'significant' fallout data has been released to the public?

Dr. DUNHAM. It is possible that that sentence and the one that follows are mutually incompatible.

—Radiation Subcommittee Hearing, May 8.

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New Swedish Cancer Discoveries Ignored by Subcommittee

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is the problem of bone cells which receive a high dose of strontium, as discussed by Swedish and Minnesota researchers to whose work we called attention in our issue of May 4. The volume containing the Swedish results, and advance proofs of the article by Prof. W. O. Caster in the *Minnesota Chemist* discussing them, were shown the Joint Committee staff director two weeks before we published our summary. The Joint Committee wrote and obtained 18 copies of the *Minnesota Chemist* article. But it was neither made available with other reprints to the press nor was Prof. Caster or any of his Minnesota co-workers invited to testify.

An Irrelevant Reply

Instead there was put on the press table a reprint of an article by Dr. Libby in the February issue of the National Academy of Sciences Annals which refers to the Swedish findings. But it is four pages of mathematical formulas incomprehensible to the layman. It begins by assuming a uniformity of distribution in the bone which the Swedes claim does not exist and it ends with conclusions which stem from its assumptions. Since cancer is a cellular disease and one cell is enough to set off its mysterious processes, non-uniform deposition of strontium in the cell structure of the bone may require serious downward adjustments in maximum permissible limits of exposure. If the Swedes are right, current limits are dangerously high. Surely this deserved discussion.

Except for Senator Anderson, no member of the radiation subcommittee tried to get at the truth behind the cutest bit of AEC press agentry at the hearings. This was the statement in the General Advisory Committee report to the AEC that Sr-90 in food and water "is less of a hazard than the amount of radium normally present in public drinking water supply in certain places in the United States, and in public use for many decades." This translates reassuringly in the public mind as "no more dangerous than drinking water."

Senator Anderson drew from Dr. Dunham the information "actually what they are referring to is the drinking water which serves a population of several hundred thousand people" in the Midwest who use well water with a higher than average radium content. "Mostly Illinois has been studied," Dr. Dunham said. I asked the AEC press division after the hearings what these studies had found. The answer, after consultation with the Argonne lab in Chicago, was that the studies were still in progress and no specific findings had yet been made. If these studies are still in process and no findings have yet been made, the GAC does not know how much of a hazard these special situations represent and it had no scientific basis for its glib comparison.

Fast Fellow

"We will try at the end of the hearing to have a cold-blooded analysis of the testimony giving both viewpoints on any subject. . . We will not try to editorialize on the hearings nor to suggest that you stop bomb testing or that you continue it."

—Cong. Chet Holifield, radiation hearings, May 6.

"It is clear now that the possible hazard is very small in comparison to the needs of our defense. I believe testing could be resumed, if necessary, at a limited rate."

—Cong. Chet Holifield, Washington Star, May 11.

The Bias Showed

Congressman Holifield and Senator Pastore swallowed this flim-flam without a gulp, and did not appeal to the press to put it in "proportion." But they publicly rebuked Edward Gamarekian, *Washington Post* science writer, one of the few independent minded journalists covering the hearings, for "irresponsible reporting." He played up figures from an AEC report which showed that white bread sold in a New York City supermarket on February 19 had four times the maximum permissible limit of strontium-90. Holifield admitted the story was "accurate" but complained that the facts were put "into disproportion." The sudden journalistic fastidiousness of Holifield and Pastore was explained when the latter said he was glad the truth about the Gamarekian figures had been "cleared up" because "only today I heard a suggestion that we go ahead with another plan on cessation of tests only because of this story." The bias behind these hearings is the desire of a majority on the Joint Committee to make a case for a resumption of testing. On this they stand arm-in-arm with the AEC.

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HOW YOU CAN HELP

Except for papers like the Washington Post and the St. Louis Post-Dispatch, press coverage of the radiation hearings has been poor, and our greatest newspaper, the New York Times, has been among the worst. The only full text it supplied was the soothing syrup of the General Advisory Committee. Everything having to do with the AEC, from Admiral Strauss to nuclear testing, gets sacred cow treatment from it. Reassuring statements make its front page but bad news about fallout is generally pushed back to the shipping news.

There is much in our issue this week which more people ought to know about. You can help by buying reprints of this issue in bulk at nominal prices—3 cents a copy per thousand postpaid—for organizational distribution and by forming neighborhood study groups on nuclear problems.

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